Space Weather Forecast

Issued on Monday, 11 July 2022 at 13:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further M-class flares likely with a slight chance of X class flares giving R1 to R3 Radio Blackouts. Chance of G1/Minor Storms mainly late day 2 (12th) into day 3 (13th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate with two M class flares observed from AR3056 in the SE. A filament lift-off was also observed around 10/1700 UTC, which resulted in a CME visible off the southwest limb. Enlil suggests this CME is not Earth-directed. No other Earth-directed CMEs were observed.
There are seven sunspot regions on the visible disc in total, with the two largest approaching the centre of the disk. Two newly numbered regions are emerging in the east, including 3056 which has been flaring and appears to be increasing its magnetic complexity.
Solar Wind / Geomagnetic Activity: The solar wind generally followed a slow regime and showed little change. The number of particles comprising the solar wind was mainly within usual background levels. The magnetic field associated with these particles was mostly Weak as was the important north-south component. The net result of the above solar wind measures was Quiet geomagnetic activity.
Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be moderate with further moderate-class flares likely and a slight chance of strong (X-class) flares.
Solar Wind / Geomagnetic Activity: A glancing blow from a CME may affect Earth late on day 1 (11th July) but confidence is low. Another and more prominent CME may arrive at Earth at the end of day 2 (12th) or early on day 3 (13th). Solar winds may become enhanced today, under the influence of the HSS from CH99/+, and stay elevated through much of the forecast period. Geomagnetic activity is expected to be largely Quiet to Unsettled with a chance of an Active interval on days 1 and 2 (11th and 12th) but to become increasingly Unsettled and Active at the end of day 2 and into day 3 (12th and 13th), with a Chance of G1/Minor Storms or G2/Moderate Storms under the influence of the CME that left the sun late on 9 July. During day 4 (14th) geomagnetic activity is expected to return to mainly Quiet.
Energetic Particles / Solar Radiation: Unless there is significant sunspot development, the high energy proton flux (greater than 10 MeV) is likely to remain at Background levels. There is however a daily Slight Chance of S1 or greater, due to the presence of two relatively large sunspot regions close to the centre of the disk.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	30	50	10
Strong	G3	No	1	2	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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